

Claims

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1. A method for controlling power in a network transmitted from a first station to a second station, wherein said second station determines (S 202) a power target value (505) for a signal received from said first station and sends power control commands (506) to said first station depending on a deviation between said power target value (505) and a received power level (504),

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said second station performing the steps of:

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- detecting (S 101) faulty data blocks (503) received from said first station,
- requesting (S 102) retransmission of faulty data blocks (503) from said first station, and
- adjusting (S 105) said power target value (505) to a temporary power target value (512) during said retransmission, wherein said temporary power target value (512) is calculated (S 206) depending on the quality of said faulty data block (503).

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2. A method according to claim 1, wherein said quality is estimated (S 103, S 205) as a performance metric, which indicates how much additional signal energy is required during retransmission in order to detect a faulty data block (503) correctly after receiving a retransmitted version (507) of said faulty data block (503).

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3. A method according to claims 1 or 2, wherein said faulty data block (503) is combined with its retransmitted version (507).

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4. A method according to any one of the proceeding claims, wherein said retransmitted version (507) is similar to the first version of said faulty data block (503).
- 5 5. A method according to any one of claims 1 to 3, wherein said retransmitted version (507) contains additional redundancy.
6. A method according to any one of the proceeding claims, wherein said temporary power target value (512) for retransmission is calculated (S 206) as a function of the current power target value (505) for first transmission (503) of a data block and the quality.
- 10 7. A method according to claim 6, wherein said temporary power target value (512) for retransmission is calculated (S 206) as the power target value (505) for first transmission (503) of a data block minus (403) the quality weighted (402) by a predetermined power control step size (401).
- 15 8. A method according to claim 6 or 7, wherein said temporary power target value (512) is calculated based on the following equation:
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$$Eb/N0_target_retrans = Eb/N0_target - quality * x \text{ dB}$$
wherein $Eb/N0_target_retrans$ is said temporary power target value (512) for retransmission (507), $Eb/N0_target$ is said power target value (505) for first transmission of a data block (503), and x is a fixed power control step size (401) in dB.
- 25 9. A method according to any one of the proceeding claims, wherein said adjustment (S 105) of said power target value (505) is performed at the beginning (508) of a retransmission of a faulty data block (507).
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10. A method according to any one of the proceeding claims, wherein a transition (510) back to the power target value (505) for first transmission of a data block (503) is performed before the beginning of the next data block (511), such that the received power level (504) is at the power target value (505) for first transmission when the next data block begins.
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11. A method according to any one of the proceeding claims wherein a data block (503, 507, 509, 511) is divided into a number of slots (502) and wherein the number of slots (502) that said temporary power target value (512) is in use depends on said power control step size, the total number of slots (502) within a data block (503, 507, 509, 511), and the distance between said power target value (505) for first transmission and said temporary power target value (512).
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12. A method according to any one of the proceeding claims, wherein said temporary power target value (512) is calculated depending on a delay before said temporary power target value (512) is met.
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13. A method according to any one of the proceeding claims, wherein said power control commands (506) respectively comprise a bit indicating whether to increase or to decrease a transmission power level of said first station by said fixed power control step size.
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14. A method according to any one of claims 1 to 12, wherein said power control commands respectively comprise a number of bits indicating whether to increase or to decrease said transmission power level as well as indicating a variable power control step size.
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15. A method according to any one of claims 1 to 12, wherein said power control commands respectively comprise a number of bits indicating an explicit value for said transmission power level.
- 5 16. A method according to any one of the proceeding claims, wherein said step of detecting (S 101) faulty data blocks comprises a cyclic redundancy check (CRC).
- 10 17. A method according to any one of the proceeding claims, wherein said quality is estimated based on
- a) a bit or packet error rate of the received data stream,
 - b) soft information obtained from a Viterbi decoder used for decoding convolutional codes, and/or
 - c) the received signal-to-interference ratio.
- 15 18. A device for controlling power in a network transmitted from a first station to said second station, comprising:
- means (607) for determining (S 202) a power target value (505) for a signal received from said first station,
 - 20 - means (608) for generating power control commands (506) for said first station depending on a deviation between said power target value (505) and a received power level (504),
 - means (604) for detecting (S 101) faulty data blocks (503) received from said first station,
 - 25 - means (605) for requesting (S 102) retransmission of faulty data blocks (503) from said first station, and
 - means (606) for adjusting (S 105) said power target value (505) to a temporary power target value (512) during said retransmission, wherein said temporary power target value (512) being calculated (S 206) depending on the quality of said
 - 30 faulty data block (503).

19. A device according to claim 18, wherein said second station is a base station and said first station is a mobile station used in a mobile network, in particular in an UMTS/WCDMA network.
- 5 20. A device according to claim 18 or 19, comprising means for carrying out a method according to any one of claims 1 to 17.